ACI News Letter

Vol. 26, No. 2 JOURNAL of the AMERICAN CONCRETE INSTITUTE October 1954

Kemano penstock encased with all-around economy

11-foot diameter penstock under construction for Alcan hydro power plant at Kemano, B. C. Note that solid Prepakt Concrete backing makes all-around contact to resist pressure stresses at world's largest underground powerhouse.

▶ At Kemano, B. C., the Aluminum Co. of Canada, Ltd., has built the world's largest underground power plant to supply its new aluminum smelting facilities at Kitimat, B. C. Penstock encasement work for this project was done by Prepakt with outstanding economy and results.

Use of Prepakt Concrete to embed 3,900 feet of 11-foot diameter steel penstock lining eliminated the expense of later contact grouting. Exhibiting no setting shrinkage, Prepakt Concrete assures complete concrete backing with full 360° contact—*without after grouting!* At Kemano, this Prepakt advantage bonds the steel, concrete and natural rock into an integral high-strength mass which resists the high pressures developed by the 2,600-foot head of water.

Prepakt Concrete was made in place by pumping Intrusion Mortar into coarse aggregate preplaced in the annular space between the steel penstock lining and the excavated rock outline. Encasing Kemano's ¼-mile No. 1 penstock required 19,000 cu. yds. for two 48°– sloping sections, 8,000 cu. yds. for two horizontal runs.

The lower 2,000-foot sloping section was encased in one continuous lift! Simultaneous aggregate placement and pumping of mortar was used in around-the-clock work to encase the tunnel in 21 working days. Upper 1,200-foot sloping section was done in two lifts of 400 and 800 feet.

This is another example of the economy obtainable with Prepakt methods and materials.

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News Letter Contents

October 1954

On the Cover — A striking example of reinforced concrete construction in Havana, Cuba, the Retiro Odontologico owned by the Dentist Assn. of Cuba. The building is 23 stories, including the basements which are used for a parking garage. The slender columns of the three lower floors and basements were made with concrete having a 28-day compressive strength of 8000 psi. Architects — Antonio Quintana, Manuel A. Rubio, and Augusto Perez Beato. Structural engineers — Luis Saenz Duplace and R. Cancio. Concreto Caribe, S. A., furnished the concrete. —*Courtesy Celso A. Carbonell (Panama)*

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Whitney nominated for president

Price receives vice-president nomination

The 1954 ACI Nominating Committee, consisting of Charles W. Allen, chairman, H. K. Cook, Joseph Di Stasio, A. T. Goldbeck, W. C. Hanna, Henry L. Kennedy, Walter H. Price, and Harry F. Thomson, reports the following nominations for election at the 51st annual convention in Milwaukee, Feb. 21-24, 1955.

For President

Charles S. Whitney to succeed Charles H. Scholer for a one-year term beginning at the February, 1955, convention.

Mr. Whitney, partner in the consulting engineering firm of Ammann and Whitney, New York and Milwaukee, has been an ACI member since 1920. He was elected vice-president of the Institute in 1953, was a member of the Board of Direction 1945-1946 and 1950-1952, and is a member of ACI's Standards Committee. He is chairman of ACI Committee 312, Plain and Reinforced Concrete Arches, and ACI-ASCE Joint Committee 327, Shear and Diagonal Tension. He is also a member of ACI Committee 214, Evaluation of Results of Compression Tests of Field Concrete, and ACI-ASCE Joint Committee 327, Ultimate Load Design.

Mr. Whitney is well known for his contributions to reinforced concrete design, particularly in shell construction and other arched structures. Honors to Mr. Whitney are many, including the ACI Wason Medal for the most meritorious paper in 1932, "Plain and Reinforced Concrete Arches;" the Alfred E. Lindau Award in 1951 "in recognition of his many contributions to reinforced concrete design practice;" the Fuertes Graduate Medal of Cornell University twice; and the American Society of Civil Engineers J. James Croes Medal.

Continued on p. 4

He received a CE degree from Cornell University in 1914 and his MCE in 1915 from the same school. Following graduation, he held positions with Gustave Lindenthal on Hell Gate Bridge and Bronx Viaduct, New York Connecting Railroad, and as assistant engineer with John Parkinson, architect, Los Angeles. After serving in the Corps of Engineers during World War I, he was chief engineer to A. C. Eschweiler, architect, Milwaukee, and chief engineer and manager of the Milwaukee office of Hool & Johnson, engineers. From 1922 to date he has been a consulting and designing engineer, specializing in city planning, design and supervision of buildings, bridges, defense installations, and other projects.

For Vice-President

Walter H. Price for a two-year term beginning at the February, 1955, convention.

Long active in Institute affairs and technical committees, Mr. Price is head of the U. S. Bureau of Reclamation's engineering laboratories, Denver, Colo. He is chairman of the Standards Committee, ACI Committee 210, Resistance to Erosion in Hydraulic Structures, and Committee 613, Recommended Practice for Proportioning Concrete Mixes. He was a member of the Board of Direction 1951-1954, and has been an ACI member since 1937.

Mr. Price was awarded ACI's Wason Medal for the most meritorious paper in 1951 for the paper "Factors Influencing Concrete Strength."

A 1930 civil engineering graduate from Tulane University, Mr. Price has been with the Bureau of Reclamation since that year. The first two years were spent on hydraulic model studies in connection with spillway designs of Hoover, Madden, and other dams, and then two years on the structural design of Hoover Dam spillways and power plant. Since 1934 his work has been devoted to materials testing and research problems related to the construction of dams and irrigation works. Prior to becoming chief of the engineering laboratories he was head of the materials laboratories.

Frank Kerekes, assistant dean, Division of Engineering, Iowa State College, Ames, Iowa, elected for a two-year term as vice-president at the 1954 convention in Denver, continues in that office.

Directors

For Directors, three-year terms, four nominations for as many places on the Board: H. C. Delzell, Thomas B. Kennedy, Walter J. McCoy, and Douglas McHenry.

Mr. Delzell is managing director of the Concrete Reinforcing Steel Institute and has been that organization's representative in ACI since 1940. He has already served one previous term on the Board of Direction from 1949 to 1951. He was recently appointed to ACI Committee 317, Reinforced Concrete Design Handbook.

Mr. Kennedy, chief of the Concrete Division, Waterways Experiment Station, Corps of Engineers, Vicksburg, Miss., has been an ACI member since 1940. He is a member of ACI Committee 115, Research; 609, Compaction of Concrete by Mechanical Means; and 613, Recommended Practices for Proportioning Concrete Mixes.

He has been with the Corps of Engineers since 1931, graduating in chemistry from the University of Illinois in 1930. He worked in the St. Louis District on various concrete construction projects until 1939 when he joined the staff of the Central Concrete Laboratory of the North Atlantic Division. In 1946 when the functions of the Central Concrete Laboratory were transferred to the Waterways Experiment Station, Mr. Kennedy became chief of the Concrete Branch of the Concrete Division, and recently chief of the division.

Mr. McCoy, a member of the Technical Activities Committee, is director of research for Lehigh Portland Cement Co., Coplay, Pa. With co-author A. G. Caldwell, he was the recipient of ACI's Wason Medal for Research for work reported in their 1951 paper "New Approach to Inhibiting Alkali-Aggregate Expansion."

Mr. McCoy graduated from Wisconsin State College and received a master's degree from the University of Minnesota. He has been with Lehigh since 1938, and an ACI member since 1946. A member of Committee 115, Research, he is also active on ASTM committees on cement, concrete, and mortars.

Mr. McHenry, a member of the Technical Activities Committee and past chairman of that group, has been active in Institute affairs since 1936. He is director of development, Portland Cement Assn., Chicago, Ill.

He joined PCA in 1952 as administrative assistant to A. Allan Bates, vice-president for research and development.

He previously was with the U. S. Bureau of Reclamation, Denver, Colo., for 11 years, where he was head of the Structural Development Section and later chief of the Concrete Laboratory Section. Before joining the staff of the Bureau of Reclamation in 1940 as head of the special studies unit in the dam design division, Mr. McHenry served for six years with the Tennessee Valley Authority. Here he worked on the construction of Norris and Hiwassee dams and power plants, and on research studies of the structural behavior of TVA structures. He previously had worked for Southern California Edison Co. and Phoenix Utility Co. in Washington on dam construction projects. He attended the University of Minnesota.

Nominating Committee

The 20 candidates for membership on the 1955 Nominating Committee—five to be elected—are:

Charles W. Allen	William Lerch
R. A. Burmeister	James A. McCarthy
Roy W. Carlson	Richard C. Mielenz
Miles N. Clair	Douglas E. Parsons
Harold F. Clemmer	Charles T. Räber
A. D. Conrow	Harry F. Thomson
Herbert K. Cook	Lewis H. Tuthill
Joseph Di Stasio	George W. Washa
W. C. Hanna	George C. Wilsnack
J. W. Kelly	Charles E. Wuerpel

Paul F. Rice joins ACI staff

A significant step in the Board of Direction's intention to improve and expand ACI's service to its members was realized Sept. 16, 1954, when Paul F. Rice joined the ACI staff as Technical Director. Among Mr. Rice's duties will be field and office work to promote and improve technical relations with other technical societies and organizations, assist member groups in organizing and conducting small local meetings, contact likely authors of papers in areas not adequately covered by volunteered papers, and upon request to assist ACI technical committees in preparation of reports and in answering technical inquiries. In short, Mr. Rice's efforts will be directed toward increasing the value of affiliation with ACI to the present membership and to encourage those present nonmembers whose interests are in concrete to become members.

Mr. Rice studied at North Dakota State College, Illinois Institute of Technology, Massachusetts Institute of Technology (where he received his MS in civil engineering), and at the University of Michigan.

His professional experience includes structural detailing and shop inspection of fabricated steel, assistant instructor in drafting, field inspection and laboratory testing of concrete, structural designing, estimating, and five years as a structural field engineer for the Portland Cement Assn. He served 39 months during World War II in a U. S. Army aviation engineer battalion with responsibilities for paving, building construction, labor and supply procurement, and earthmoving.

Keatinge elected vice-president

Paul F. Keatinge has been elected vice-president and director of sales of Trinity white cement for General Portland Cement Co., Chicago, Ill. Mr. Keatinge joined Trinity Portland Cement Co. in 1940, which later became the Trinity division of General Portland Cement Co.

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Joint ACI-ASCE Committee 323, Prestressed Reinforced Concrete, Reviews Progress

This committee was organized in 1942 as ACI Committee 323 under the chairmanship of the late Arthur J. Boase. The committee was assigned the task of reviewing present knowledge of prestressed concrete, developing design procedures, and recommending needed research. The first work undertaken by the committee was the collection of a bibliography of literature on prestressed concrete.

In 1949 the committee was reorganized under the chairmanship of A. E. Cummings. It was enlarged and divided into four subcommittees to each of which a definite task was assigned as follows: Subcommittee I—Bibliography; Subcommittee II—Patents; Subcommittee III—Notations, Definitions, Specifications, and Codes; and Subcommittee IV—Design and Research.

Subcommittee I has collected a bibliography consisting of over 2000 references. This bibliography has been published by the Institute and is available at $2.00 per copy from ACI headquarters. The bibliography is in loose leaf form, and it is the committee's intention to issue supplements probably once a year.

Subcommittee II reviewed the patent situation on prestressed concrete, and Curzon Dobell, chairman of this subcommittee, prepared a paper describing the patent situation on prestressed concrete as it was early in 1950. This paper, "Patents and Codes Relating to Prestressed Concrete," was published in the ACI JOURNAL, May 1950, *Proc.* V. 46, p. 713. This subcommittee is again reviewing the patent situation with the intention of bringing it up to date with a short paper to be published in the near future in the JOURNAL.

Subcommittee III under the chairmanship of C. P. Seiss prepared a set of definitions and notations, "Proposed Definitions and Notations for Prestressed Concrete," which were published in the ACI JOURNAL, Oct. 1952, *Proc.* V. 49, p. 85. These definitions and notations have been the subject of a considerable amount of discussion, some of which was published in the Dec. 1953, Part 2, JOURNAL.

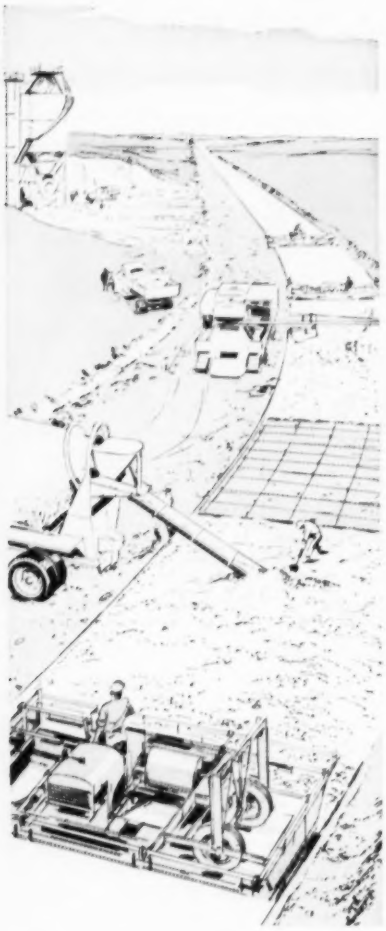
In 1952 Committee 323 was reorganized again into a joint committee with the Structural Division of the American Society of Civil Engineers. Additional members were added to the committee by the appointment of ASCE representatives from the Structural Division.

At a meeting of the new joint committee during the Centennial of Engineering in Chicago in September, 1952, a decision was made to prepare a "Report on Recommended Practice for Prestressed Concrete." A steering committee was appointed to prepare an outline of the material to be covered in this report. This steering committee reported during the annual convention of the Institute at Boston in February, 1953. At that meeting it presented a tentative outline of the proposed report for consideration by the entire membership of the joint committee.

Also during the meeting at Boston an organization chart was presented for consideration by the entire committee. The proposed outline as well as the organization chart prepared by the steering committee were finally accepted by the entire committee during the annual meeting of the Institute at Denver in February, 1954. The organization of all task committees for the preparation of the report was completed, and it was agreed that the document will be called "First Report on Recommended Practice for the Design and Construction of Prestressed Concrete Structures."

The following is the table of contents of the report: Preface; Chapter 1—Introduction; Chapter 2—Materials; Chapter 3—Design—General; Chapter 4—Design—Buildings; Chapter 5—Design—Bridges; Chapter 6—Construction; Appendix I—Summary of Design Criteria; and Appendix II—Tests. Each chapter will be divided into sections and small task committees have been appointed to prepare each section.

Continued on p. 9



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The steering committee which is responsible for the entire report includes the following members: C. P. Siess, chairman; R. Archibald; A. E. Cummings; C. Dobell; T. Germundsson; M. J. Holley, Jr.; N. M. Newmark; and H. Simpson.

The working committees are divided into three task groups covering materials, design, and construction. The organization of these task groups is as follows:

Task Group A—Materials (Chapter 2)
Chairman: H. Simpson

Task Group B—Design (Chapters 3, 4, and 5)
Chairman: M. J. Holley, Jr.
Sub-Group B3—Design–General (Chapter 3)
Chairman: M. J. Holley, Jr.
Sub-Group B4—Design–Buildings (Chapter 4)
Chairman: T. Germundsson
Sub-Group B5—Design–Bridges (Chapter 5)
Chairman: R. Archibald

Task Group C—Construction (Chapter 6)
Chairman: C. Dobell

These task groups are subdivided into small task committees each consisting of a chairman and three or four members. In addition to the members of Committee 323, 85 other engineers are organized into about 40 task committees working on the project. There is overlapping of membership among the task committees since some of the men are assigned to more than one task committee. A list of those who are working on the various task committees follows.

Abeles, P. W.*
Alexander, R. B.
Amirikian, A.*
Anderson, A. R.
Angwin, H. W.
Appleton, J. H.
Archibald, R.*
Armour, C. V.
Bartels, W. R.
Billington, D. P.
Birdsall, B.
Blair, P. F.
Blanks, R. F.
Blessey, W. E.*
Blumenschein, E. W.
Boardman, E. T.
Bowie, P. G.*
Bryan, R. H.
Cargill, D. O.
Closner, J. J.
Corbetta, R. H.
Crom, T. R.
Cummings, A. E.*
Davis, R. E.
Dean, W. E.
Dobell, C.*
Douglass, M. K.
Drew, F.
Elcock, E. S.
Erickson, E. L.
Everling, W. O.*
Formigli, O. L.
Fornerod, M.
Garrett, C. L.
Geer, E.
Germundsson, T.*
Godfrey, H. J.
Goodman, W.
Gray, S.
Gut, T. J.
Hancock, J. S.
Hansen, R. J.
Hanson, G. C.
Hanson, N. W.
Hanson, W. E.
Hicks, J. N.
Hoeffel, O. E.
Hognestad, E.
Holley, M. J., Jr.*
Janney, J. R.*
Jensen, I. R.
Jones, A. W.
Jurkovitch, W. J.
Kesler, C. E.
Koebel, F. E.
Lee, D. H.
Lemon, G. L.
Leonhardt, F.
Libby, J. R.
Lin, T. Y.*
Lount, A. M.
Maag, E. J.
Magers, L.
McLeod, E. A.
Mennis, J. J.
Mitchell, N. D.
Mitchell, S.
Molke, E. C.
Moorman, R. B. B.
Muller, J.
Munse, W. H.
Newmark, N. M.*
Nordby, G. M.
Nutter, J. R.
Orowan, E.
Panhorst, F. W.
Parme, A. L.
Parsons, D. E.*
Patterson, D.
Paxson, G. S.
Peckworth, H. F.*
Pickworth, J. W.
Polychrone, D. A.
Porter, L. A.
Preston, H. K.*
Puffer, H. R.
Rice, E. K.
Robertson, A. F.
Rundlett, J. C.
Sailer, R.
Sawyer, G. I.
Schantz, C. P.*
Schwab, A. W.
Shank, M. E.
Shieber, J. H.
Siess, C. P.*
Simpson, H.*
Stainer, C. C.
Steele, R. K.*
Strobel, G. C.
Thompson, J. P.
Thorsen, N.
Vick, A. D., Jr.
Viest, I. M.
Whittle, R. D.
Wittenmyer, R.*
Zollman, C. C.
Zwoyer, E. M.

*Members of ACI-ASCE Committee 323.

The work of some of the groups is proceeding faster than that of others, and in some cases it will be necessary for one group to complete most of its work before other groups can complete theirs. It is expected that parts of the report may be ready for publication during the spring of 1955.

Roscoe retires

Ralph E. Roscoe has retired as vice-president, The Bessemer Limestone and Cement Co., Youngstown, Ohio. Mr. Roscoe has been an ACI member since 1930 and is an honorary member of ASTM.

Lurie becomes assistant chief

Erwin M. Lurie, formerly materials engineer, Housing and Home Finance Agency, is now assistant chief, Facilities Branch, Field Service Division, Office of the Quartermaster, U. S. Department of the Army, Washington, D. C.

REGIONAL MEETING PROGRAM

Thursday a.m., October 28—Properties and Tests of Concrete (Hugh Barnes, chairman)

"The Ball Test for Penetration of Fresh Concrete," by J. W. Kelly and Milos Polivka, University of California, Berkeley, Calif.

"Alkali-Aggregate Reaction—What It Is and What To Do About It," by Hubert Woods, director of research, Portland Cement Assn., Chicago, Ill.

"Test Hammer Provides New Method of Evaluating Hardened Concrete," by Gordon W. Greene, testing engineer, Pacific Coast Aggregates, Inc., Fresno, Calif.

"Determination of Cement Content of Concrete Before Hardening," by J. H. Walker, general manager, Research and Development Laboratory, Portland Cement Assn., Chicago, Ill.

Thursday p.m., October 28—New Techniques and Recent Developments in Concrete Design and Construction (R. W. Spencer, chairman)

"Strength of Continuous Prestressed Beams Under Static and Repeated Loads," by T. Y. Lin, University of California, Berkeley, Calif.

"Ortega-Billner Precast Roof," by K. P. Billner and George J. Hartman, president and engineer, respectively, Vacuum Concrete, Inc., Philadelphia, Pa., and Sidney Shore, University of Pennsylvania, Philadelphia

"The Use of Large Tendons in Pre-Tensioned Concrete," by Niels Thorsen, Freyssinet Co., Inc., New York, N. Y.

"Plant Production of Precast Concrete Products for Buildings and Laboratory Control Operations," by Jack Streblow and Carl M. Rollins, Basalt Rock Co., Inc., Napa, Calif.

Friday a.m., October 29—Earthquake and Blast Design of Reinforced Concrete Structures (V. P. Jensen, chairman)

"Earthquake Resistant Design Based on Dynamic Properties of Earthquakes," by G. W. Housner, California Institute of Technology, Pasadena, Calif.

"An Example of the Use of Dynamic Load Parameters in Structural Analysis," by James A. Cheney, associate engineer, L. T. Evans, Foundation Engineer, Los Angeles, Calif.

"Performance of Reinforced Concrete and Concrete Masonry in Recent Western United States Earthquakes," by Karl V. Steinbrugge and Donald F. Moran, structural engineers, Pacific Fire Rating Bureau, San Francisco and Los Angeles, Calif., respectively

Friday p.m., October 29—Forum sponsored by Structural Engineers Assn. of Southern California

Panel members: moderator, Rolland Cravens, chief, Mechanical Bureau, Los Angeles Department of Building and Safety, Los Angeles; William T. Wright, partner, Kistner, Wright & Wright, Los Angeles; Henry M. Layne, structural engineer, Los Angeles, Harold P. King, structural engineer, Sherman Oaks, Calif.; S. B. Barnes, structural engineer, Los Angeles; and Michael V. Pregnoff, partner, Hall & Pregnoff, San Francisco

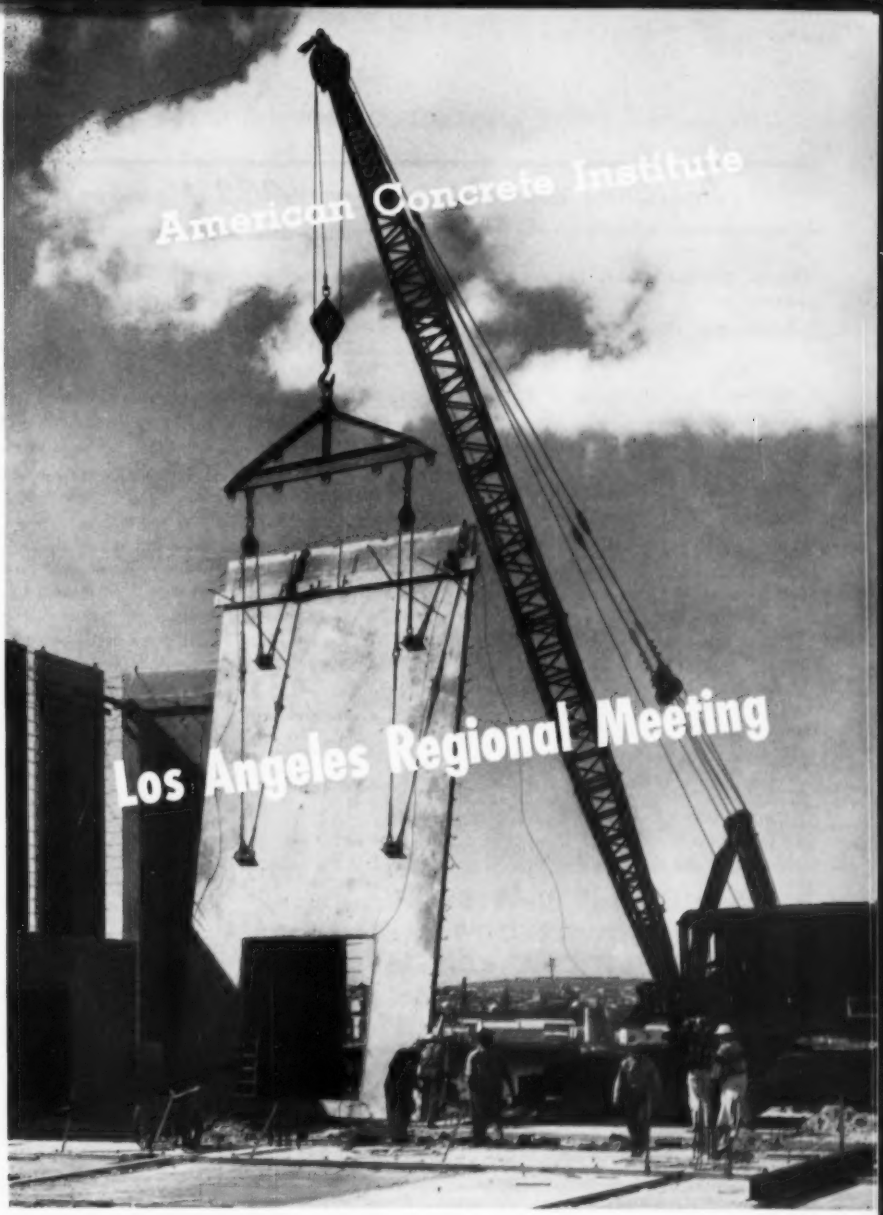
"Compressive Strength of Concrete Correlated with Aggregate Rattler Loss," by Everett A. Jumper and John D. Herbert, members, Technical Committee of Southern California Rock Products Assn. and Southern California Ready-Mixed Concrete Assn., and Curtis W. Beardsley, director, Los Angeles City Bureau of Standards

"Color and Texture by Aggregate Transfer Method," by Robert E. Boner, architect, Portland Cement Assn., Los Angeles, Calif.

"Edwards Air Force Base Heavy-Duty Airfield Pavements: Design and Construction Features," by Robert J. Shultz and Robert B. Fatherson, Corps of Engineers, U. S. Army, Los Angeles, Calif.

"A Special Purpose Waterfront Structure of Precast Reinforced Concrete," by W. E. Wilson, partner, Wilson & Wilson, Consulting Structural Engineers, Los Angeles, Calif.

See you in Los Angeles



October 28-29, 1954

Hotel Statler **Los Angeles**

Positions and Projects — ACI Members

Recent appointments to ACI technical committees

Included in this list are *new* appointments only.

Committee 212, Admixtures
Harold Allen
Bureau of Public Roads

Committee 215, Fatigue of Concrete
C. P. Siess
University of Illinois

Committee 317, Reinforced Concrete Design Handbook
O. W. Irwin
Rail Steel Bar Assn.
H. C. Delzell
Concrete Reinforcing Steel Institute

Committee 324, Precast Concrete
D. P. Jenny
Portland Cement Assn.

Committee 331, Structures of Concrete Masonry Units
W. S. Callender
Concrete Products Assn. of Washington

Committee 613, Recommended Practice for Proportioning Concrete Mixes
E. J. Peltier
Bureau of Yards and Docks, U. S. Navy

Everling speaks on prestressed concrete

With prestressed concrete becoming ever more popular, the behavior of high tensile steel wire in that use plays an increasingly important role in modern architecture and design, Walter O. Everling, director of research, American Steel and Wire Division, United States Steel Corp., said at the recent general meeting of American Iron and Steel Institute in New York.

Mr. Everling said that no failures from any cause have been reported to date among some 1000 factories, bridges, and other lineal structures built since the 1920's with prestressed concrete involving the use of steel wire. He added that such steel wire applications in circular structures, such as tanks and pipe, have been nearly as successful over the years. He said that a probable cause for the few exceptions has been found and can be allowed for in the future.

As the result of studies on specimens of wire used in prestressed concrete, three major conclusions have been reached, according to Mr. Everling. First, of the salts which are likely to be found in soils or ground waters, only the nitrates have been found to cause stress corrosion failure. Second, hard drawn wire is better for use in prestressed concrete than oil tempered wire because it is less sensitive to stress corrosion. Finally, since all high strength steel wire used in prestressed concrete must be protected adequately against any type of corrosion, it follows that stress corrosion failure may be expected only in cases where such general protection breaks down.

Mr. Everling described two series of tests by which his conclusions were reached. He cited the fact that a survey of the literature revealed only one previous report on stress corrosion in high carbon steel.

Muchemore opens private practice

Stephen E. Muchemore, formerly with Lockwood Greene Engineers, Inc., New York, N. Y., has opened consulting offices under the name of The S. E. Muchemore Associates, Inc., Stamford, Conn.

American contractors to build Australian power project

A contract has been awarded to a joint venture group of seven American construction firms to build the $60,000,000 Snowy Mountain dam and power project in southeast Australia.

The joint venturers are Kaiser Engineers, division of Henry J. Kaiser Co., Oakland, Calif., as the sponsors; Walsh Construction Co., New York; B. Perini & Sons, Inc., Boston; Raymond Concrete Pile Co., New York; General Construction Corp., Seattle, Bates & Rogers Construction Corp., Chicago; and The Arthur A. Johnson Corp., New York.

Total work involved on the Snowy Mountain project includes the construction of seven major dams, over 80 miles of large

Waneta Power Dam
Trail, B.C., Canada

Another half-million tons of Protex concrete, where climatic changes are severe and placement difficult. Protex was specified specifically for this 250' high project.

Hungry Horse Dam, Montana

Over 3 million cu. yds. of Protex concrete, selected for its consistent controlled air quality and proven economy, with no yield loss in placed concrete. Comparative tests at the project proved that, regardless of claims or names, none were as effective as PROTEX.

Where You Find Construction, You Find PROTEX* Air Entraining Solution. And Here's Why!

Scientifically formulated and processed from controlled raw materials under exacting Laboratory control to do a positive job of controlling the entrained air in a concrete mix at a minimum cost. Our leading Industrial Organization's Research and Control facilities is producing a superior Air Entraining Agent *for all types of concrete*. That's the reason for the *big swing* to PROTEX in the millions of yards of placed concrete Around the World.

This monumental tribute in concrete stands like a beacon of positive proof that PROTEX quality and reliability—coupled with honest dealings and fair prices is what the user wants. Let your PROTEX Representative give you all the facts, and experience your savings with Superior PROTEX.

Protex membrane curing compound excels latest Government specifications U.S.E.D.—C.R.D.—300-52. Reliability—quality—reasonable price are its chief advantages.

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More and more architects and engineers are turning to reinforced concrete structures because reinforced concrete is less costly. Reinforced concrete goes up faster, too, and is inherently firesafe. It offers rugged strength that is highly resistant to wind, shock, and quakes. Furthermore, it permits great flexibility of design, and materials are readily available from local sources. On your next job . . . design for reinforced concrete.

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John G. C. Sohn
Architect

A. V. Stackhouse Co.
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diameter tunnels, 17 power stations, more than 400 miles of aqueducts, and a number of subsidiary works.

The present award covers the construction of a 26-ft diameter concrete lined tunnel 14 miles long, a 100 ft high 260 ft long diversion dam, and a concrete arch dam 290 ft high and 715 ft long. Design was by U. S. Bureau of Reclamation under agreement between the Commonwealth of Australia and the U. S. Department of State.

Polatty named chief of concrete branch

James M. Polatty has recently assumed the duties as chief of the Concrete Branch of the Concrete Division, Jackson Sub-Office, Waterways Experiment Station, Corps of Engineers, Vicksburg, Miss.

Mr. Polatty has been engaged in testing and construction work since 1937, being with the Corps of Engineers since 1941. He has served as engineer-in-charge of the Mobile District Corps of Engineers Testing Laboratory, engineer on the Santee-Cooper project near Charleston, S. C., and concrete engineer at Allatoona Dam at Cartersville, Ga. At the time of his transfer to the Waterways Experiment Station he was assistant resident engineer at Jim Woodruff Dam near Chattahoochee, Fla. Mr. Polatty is a member of the American Concrete Institute and the American Society of Civil Engineers.

Cook and Kelly with Master Builders

Herbert K. Cook and Thomas M. Kelly, both formerly with the Corps of Engineers, U. S. Army, have joined the research laboratory staff of The Master Builders Co., Cleveland, Ohio, subsidiary of American-Marietta Co.

Mr. Cook was formerly chief of the concrete research division, Waterways Experiment Station, Corps of Engineers, Jackson, Miss. Active on several ACI technical committees, he is nationally known as a concrete research engineer. Mr. Kelly was masonry material research engineer in the National Bureau of Standards for ten years, and for six years he was field construction engineer for the Corps of Engineers on the Detroit, McNary, Dorena Lookout, and Dallas dams. Along with co-authors Louis Schuman and F. B. Hornibrook, he was recipient of the ACI Wason Medal for Research for work reported in their 1949 paper "A Study of Alkali-Aggregate Reactivity by Means of Mortar Bar Expansions."

Steinman honored in Europe

During his recent European tour, Dr. D. B. Steinman, internationally-known bridge engineer of New York City, received several honors.

In Rome, he was presented with a gold medal and specially engrossed diploma of honor by the International University Pro Deo.

In Paris, Dr. Steinman was presented with the Medaille de la Reconnaissance Francaise (Medal of French Recognition); there are only five prior recipients of this award. He was also presented the Gold Medal and Diploma of Honor of the French Society of Inventors, and a special gold medal of "Recognition by the Engineers of France." This medal, especially designed and minted, bears Dr. Steinman's sculptured portrait on the face and on the reverse a sculptured perspective of his design for the Messina Straits Bridge. Bronze replicas of this medal will be minted for future annual awards.

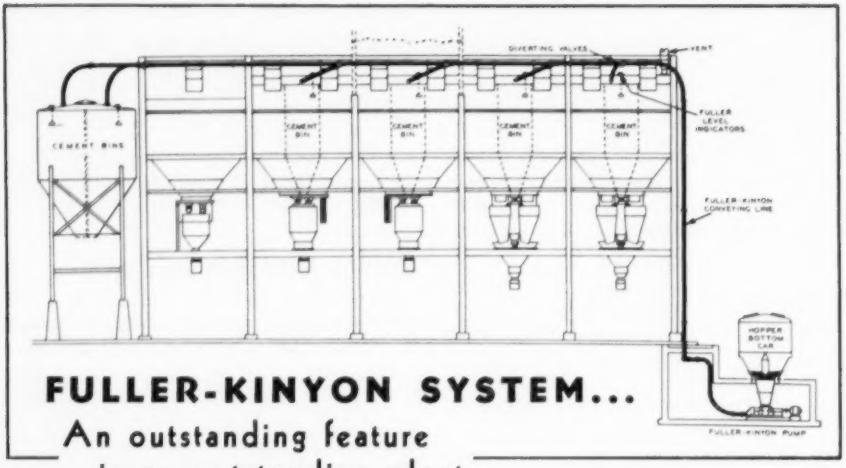
While in France, Dr. Steinman was also presented with the medal and diploma of honor of the Société Nationale des Medailles Civils, the Croix de Commandeur de l'Education Civique, Palme de Commandeur de l'Encouragement Public, and Croix de Commandeur de l'Etoile du Bien et du Merite.

Bauman elected club president

E. W. Bauman, managing director, National Slag Assn., Washington, D. C., has been elected president of the Engineers Club of Washington, D. C.

Coutris changes positions

Achilles W. Coutris, formerly instructor in civil engineering, Yale University, is now associated with Hardesty and Hanover, consulting engineers, New York, N. Y.



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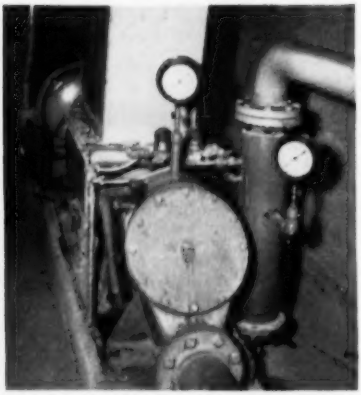
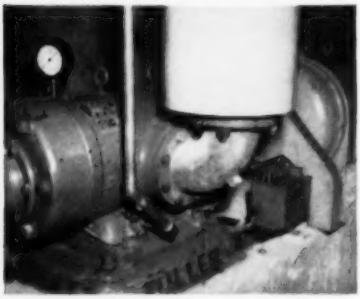


Fuller-Kinyon Pump in pit underneath tracks.

One of the ready-mixed concrete plants put into operation during 1950, Iron City Sand and Gravel Company, Pittsburgh, Penna. uses a Fuller-Kinyon System for handling bulk cement. It is said the storage and conveying system is one of the important features of this plant.

Cement, received by rail or truck, is discharged to a Fuller-Kinyon Pump, which conveys to one storage bin of 800 barrel capacity of two compartments, and four 200 barrel compartments built into the center of each of the four-compartment aggregate bins.

The system delivers to all bins through diverting valves in the conveying line, which are operated from a walkway above the bins. Automatic bin controls sound an alarm and shut down the pump whenever a bin is full. The operator can start and stop the pump from a central control panelboard.



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Fuller P-132

LOOKING AHEAD

October 18-22, 1954—New York Convention, American Society of Civil Engineers, Hotel Statler, New York, N. Y.

October 18-22, 1954—42nd National Safety Congress and Exposition, National Safety Council, Conrad Hilton, Congress, Morrison, and LaSalle Hotels, Chicago, Ill.

October 25-27, 1954 — Fourth Annual Short Course School of Instruction, American Concrete Pipe Assn., Hotel Statler, St. Louis, Mo.

October 25-27, 1954 — Construction Surveyors Institute Conference and Convention, LaSalle Hotel, Chicago, Ill.

October 28-29, 1954—Los Angeles Regional Meeting, American Concrete Institute, Hotel Statler, Los Angeles, Calif.

November 9-11, 1954 — 40th Annual Meeting, American Assn. of State Highway Officials, Olympic Hotel, Seattle, Wash.

November 15-17, 1954 — Fifth National Conference on Standards, American Standards Assn., Hotel Roosevelt, New York, N. Y.

November 19-30, 1954—Second International Congress of Civil Engineering, Caracas, Venezuela

December 10-11, 1954 — Third Annual Quality Concrete Conference, North Carolina State College, Raleigh, N. C.

January 9-13, 1955—Silver Anniversary Convention, National Ready Mixed Concrete Assn., Miami, Fla.

January 9-13, 1955—39th Annual Convention, National Sand and Gravel Assn., Miami, Fla.

January 10-13, 1955—53rd Annual Convention, American Road Builders' Assn., Roosevelt Hotel, New Orleans, La.

January 24-27, 1955 — Annual Meeting and Exposition, National Concrete Masonry Assn., Cleveland Auditorium, Cleveland, Ohio

January 31—February 4, 1955—Committee Week and Spring Meeting, American Society for Testing Materials, Netherland Plaza Hotel, Cincinnati, Ohio

February 6-11, 1955—San Diego Convention, American Society of Civil Engineers, Hotel U. S. Grant, San Diego, Calif.

February 7-9, 1955—38th Annual Convention, National Crushed Stone Assn., Netherland Plaza Hotel, Cincinnati, Ohio

February 21-24, 1955—51st Annual Convention, American Concrete Institute, Hotel Schroeder, Milwaukee, Wis.

Schaffner promoted

Associate Professor Charles E. Schaffner has been promoted to the position of assistant administrative dean of Brooklyn Polytechnic Institute, Brooklyn, N. Y. He has been director of the evening session at Polytechnic since 1951, in addition to being in charge of surveying and the highway materials testing laboratory.

A civil engineer, Dean Schaffner formerly instructed at Cooper Union, Manhattan College, and New York University before accepting an appointment as assistant professor at Brooklyn Polytechnic in 1946.

Recently the American Society for Engineering Education elected him to the national chairmanship of the evening education division. Dean Schaffner holds degrees in civil engineering from Cooper Union and Brooklyn Polytechnic Institute, and in sanitary engineering from the University of Illinois. He is a licensed professional engineer of the state of New York.

Military engineers meet

Armed Forces engineering technical sessions and industrial presentations were the features of the 1954 semiannual meeting of the Society of American Military Engineers at St. Paul, Minn., September 13-14. The American Society of Civil Engineers held a regional meeting in conjunction with the joint meeting.

Who's Who This Month

Committee 212

"Admixtures for Concrete," p. 113, is a report of ACI Committee 212, Admixtures, Willis T. Moran, chairman. Committee members are: Harold Allen, Bruce E. Foster, Frank H. Jackson, George L. Kalousek, Alexander Klein, Bryant Mather, Hubert F. McDonell, Perry H. Petersen, T. C. Powers, and Byram W. Steele.

F. Thomas Collins

F. Thomas Collins, consulting engineer, San Gabriel, Calif., describes "Precast Concrete Sandwich Panels for Tilt-up Construction," p. 149.

Mr. Collins, after receiving BA and ME degrees from Stanford University in 1934, was employed by the Union Oil Co. at Santa Fe Springs, Calif., followed by four years with Douglas Aircraft as a strength test engineer. He is secretary-treasurer of the Precast Concrete Assn., Ltd., an association dedicated to furthering the advancement of prestressed and precast concrete.

Mr. Collins is a recognized authority on precast concrete design and construction and has been teaching the subject at special sessions in various cities. He has been an ACI member since 1949.

Stanton Walker

"Production of Sand and Gravel," p. 165, is presented by Stanton Walker, director of engineering, National Sand and Gravel Assn., and National Ready Mixed Concrete Assn., Washington, D. C.

Mr. Walker, a past president of ACI, is a graduate of the University of Illinois. He was a research engineer for the Portland Cement Assn. from 1917 to 1926 and since then has been director of engineering of NSGA and NRMCA.

He is an active member of ACI Committees 115, 214, 613, 617, and 621. In addition to ACI he is a member of ASCE, ASTM, AIMME, AREA, American Foundrymens Assn., and Washington Society of Engineers.

E. M. Zwoyer and C. P. Siess

"Ultimate Strength in Shear of Simply-Supported Prestressed Concrete Beams Without Web Reinforcement," p. 181, is the joint contribution of E. M. Zwoyer and C. P. Siess, professor of civil engineering, University of New Mexico, and research associate professor of civil engineering, University of Illinois, respectively.

Dr. Zwoyer has been on the teaching staff at the University of New Mexico since 1948 with the exception of two years spent as research associate in the Civil Engineering Department at the University of Illinois. During his two years there he was actively engaged in reinforced and prestressed concrete research.

He received a BS degree in civil engineering from the University of New Mexico in 1947, MS in civil engineering from Illinois Institute of Technology in 1949 and PhD in engineering from the University of Illinois in 1953.

In addition to his teaching activities he is engaged in consulting engineering work in New Mexico including the structural design of buildings and precast concrete bridges.

Dr. Zwoyer is a member of ACI and is active in the New Mexico Chapter of ASCE and the Society of Professional Engineers and has served as secretary-treasurer of both organizations.

Dr. Siess graduated in civil engineering from Louisiana State University and then worked as soils engineer in the testing laboratory of the Louisiana Highway Commission. In 1937 he became special research graduate assistant in theoretical and applied mechanics at the University of Illinois where he received his MS in 1939 and his PhD in 1948.

Dr. Siess has been an ACI member since 1936 and is a member of ACI Committees 115, 208, 215, 318, and ACI-ASCE Committees 321 and 323. He is also affiliated with ASTM, ASCE, SESA, Highway Research Board, Sigma Xi, Tau Beta Pi, Phi Kappa Phi, Omicron Delta Kappa, and Phi Eta Sigma.

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To some, the answers will seem simple and obvious; others may prove to be extremely controversial.

All ACI members are invited to participate—either by submitting an inquiry, or even better, by telling JOURNAL *readers how an intriguing problem was solved. It may well be that readers will be able to suggest more practical solutions to inquiries than those presented.*

* * * * *

Q. What are the methods of bonding new concrete to old in floor construction?

A. Bonding of concrete to preceding lifts (construction joints) was discussed in "Problems and Practices," ACI JOURNAL *News Letter*, May 1954, p. 18. Another place where proper bond of concrete to concrete is important is in placing floor toppings on structural slabs.

Many of the recommended practices for bonding concrete at construction joints are also applicable to two-course floor construction.

In two-course work, the wearing surface or topping may be applied either before or after the base has hardened. Where the finish course is placed while the base is still plastic, it is referred to as a monolithic finish slab. Where the finish course is applied some time after the base has hardened, it is called a bonded finish.

The subfloor should be of good quality dense concrete. A base of poor quality will be unable to withstand the stresses developed by the shrinkage of a securely bonded finish and the top layer of the base will pull away, with the finish, from the rest of the base. For slab-on-ground floors, admixtures containing water repellent ingredients such as metallic soaps should not be added to the base concrete. The presence of such materials will reduce adhesion between the base and finish by interfering with the wetting of the base when the finish is laid.

Monolithic finish

Maximum adhesion between base and finish will be obtained if the finish is laid as soon as the base has stiffened sufficiently to permit working it. In deciding whether to adopt this course the likelihood of damage to the floor finish during subsequent building operations must be taken into account. For slabs on ground, a properly constructed monolithic floor finish will give an excellent wearing surface, and is less expensive than a bonded finish applied later.

The base slab is placed as dry as can be worked (about a maximum of 2-in. slump). The mix for the base slab must not permit excess water to appear at the surface. If this occurs, the wearing course absorbs the excess water, greatly reducing its strength and durability. If there is any water gain on the surface of the slab in spite of precautions taken against it, it should be removed before the topping is added.

The base course should be screeded roughly to obtain a good bond with the finished surface. The unhardened base course should be free from water, laitance, foreign matter, and loose particles.

The topping should be applied as soon as practicable, and in no case more than 45 min after screeding the rough slab. However, the base course should be stiffened sufficiently so that footprints will not be made by the workmen when placing the topping.

The finished floor should be kept continuously wet for at least seven days after it is laid.

Bonded finish

If the finish is not laid until hardening of the base is well advanced, more thorough preparation of the base will be necessary. In reinforced concrete structures, the bonded finish has been preferred as it can be laid as one of the last items on the job—not having to endure the marring and hard use in the construction of floors above.

The structural slab may be prepared for the topping by brushing during the setting period with a stiff wire brush or stiff-bristled broom once over in one direction so as to leave ridges in the surface and remove all laitance and scum. If this is done at just the right stage during the setting of the concrete, a satisfactory surface for mechanical bond of the finish will be obtained.

The base slab should be thoroughly cured for at least ten days before the finish is applied. During this interval the base must be protected from grease, paint, and other foreign substances.

Where there is laitance on the surface, or where the slab sets before it is brushed, roughening of the slab will be required before placing the topping. Recent bond tests have shown that superior bonding occurs when the exposed surface is largely clean coarse mortar. Where large percentages of coarse aggregate are exposed, the bond strength is reduced.

Roughening can be accomplished by wet sandblasting, chipping with air hammers, or by scoring or cutting with special grinders or cutters. Scoring in several different directions gives a greater bonding surface than scoring in one direction only.

All loose debris and fine particles should be removed by washing with air or water (preferably the latter) under pressure.

Immediately prior to placing the finish topping, the base course should be kept constantly wet for at least an hour before placing new concrete. It is even better to saturate the surface the day before new concrete is placed. Sufficient time should be allowed for surface wetness to disappear so that the surface will then be damp but slightly absorptive.

The base slab should be cleaned by scrubbing with clean water and a stiff brush. Any foreign substance which cannot be removed by scrubbing is chipped away and the base left thoroughly roughened.

Sometimes the base may have become contaminated with oil or grease. If the contaminated areas are small, the safest course is to cut them out. Otherwise, the best that can be done is to remove the superficial oil and grease using a suitable detergent, and then to proceed with laying the finish before the oil below the surface of the concrete has had time to rise again. However, good adhesion cannot be guaranteed in these circumstances.

Just before placing the floor finish, a slurry of neat cement, or of cement and sand, should be brushed thoroughly into the base just before spreading the concrete. The slurry of portland cement and water should be mixed to a consistency of thick paint. The

Continued on p. 29

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New Members

The Board of Direction approved 103 Individual applications, 23 Juniors, and 10 Students making a total of 136 new members. Considering losses due to resignations, deaths and nonpayment of dues the total membership on September 1, 1954 was 6574.

Individual

ACCOMANDO, PHILIP, Chicago, Ill. (Concrete Contr.)
ACKERLY, MORTON E., New Brighton, Pa. (Specifications Writer, Michael Baker, Jr., Inc.)
ALTHERR, MAURICE M., Homewood, Ill. (Concrete Constr., Altherr Constr. Co.)
AMENGUAL, ALFREDO RODRIGUEZ, Caracas, Venezuela (Director, Engrg. Firm, Road & Bldg. Contr.)
AMRHEIN, JAMES E., Long Beach, Calif. (Field Engr., PCA)
AQUINO, ALEJO, Manila, Philippines (City Engr., Dept. of Engrg. & Public Works)
ARNAN, M. A., Tel Aviv, Israel (Director, The Standards Institute of Israel)
BALINT, JOHN J., Yonkers, N. Y. (Supt. of Bldgs., Bldg. Dept.)
BAARSTAD, LAWRENCE, Portland, Ore. (Chf. of Physical Testing Section, Pittsburgh Testing Lab.)
BANKEMPER, CARL C., Covington, Ky. (Reg. Architect)
BAYLISS, JOHN R., Mobile, Ala. (Pres., Southern Laboratories)
BERNHEIMER, WALTER, Cincinnati, Ohio (Project & Plant Mgr., Cinder Products, Inc.)
BLACKBURN, KARL R., Columbus, Ohio (Struct. Engr., Ohio Dept. of Public Works)
BOOSS, GEORGE F., New York, N. Y. (C. E., Brown-Guenther-Booss, Archs., Engrs.)
CHAMORRO, FILADELFO, Managua, Nicaragua (Engr., Struct. Design, Solorzano, Villa, Pereira Co.)
CHHAYA, M. L., Jhansi, India (Distr. Engr., Central Railways)
CHOATE, ROBERT B., JR., San Francisco, Calif. (West Coast Mgr., Preload Constr. Corp.)
CHRISTIANSON, C. B., Wheeling, W. Va. (Constr. Mgr. & Chf. Engr., Engstrom & Wynn)
CICCARELLI, FRANK D., Springfield, Ill. (C. E., Illinois Div. Highways)
CLARK, ARNOTT M., Vancouver, Wash. (Insp. of Engrg. Matls., Bonneville Power Admin., Portland, Ore.)
CLARK, KENNETH M., Minneapolis, Minn. (Cons. Engr.)
CLARKE, JACQUES L., Miami Beach, Fla. (Cons. Engr., Oboler & Clarke)
COOK, JOHN C., Spokane, Wash. (Chem. Analysis, Reg. Prof. Engr., Wash. Testing Labs.)
DALLAS, BRADFORD B., Havana, Cuba (Mgr., The Antillian Constr. Co. & Gen. Constr. Co.)
DALY, BENEDICT T., South Boston, Mass. (Materials Testing, City of Boston, Highway Div.)
DESMIER, ERIC WILLIAM, Montreal, Canada (Field Engr., George Hardy Ltd.)
DREISIG, WILLIAM M., Detroit, Mich. (Service Engr., The Master Bldrs. Co., Cleveland, Ohio)
ELKOW, MILTON O., Kingston, N. Y. (Res. Engr., D. B. Steinman)
FOSTER, C. W., Tuscaloosa, Ala. (Asst. Mgr. & Sales Engr., Bama Concrete Co.)
FRANCO, JOSE GONZALEZ, Bronx, N. Y. (Chf. Designer, Schulman & Soloway)
FREEMAN, PAUL O., Montreal, Canada (Design & Promotion Engr., Dominion Tar & Chemical Co. Ltd.)
GALINDO, ENRIQUE GARCIA, Caracas, Venezuela (Engr. & Bldg. Constr.)
GALOWITCH, WERNER FRED, Chicago, Ill. (Partner, John Galowitch Co.)
GARRETT, C. L., Chicago, Ill. (Struct. Engr., PCA)
GAWLINSKI, STANISLAW J. V., Cambridge, Mass. (Struct. Engr., Maurice A. Reidy, Boston)
GOOCH, EDWARD KILLOCH, Welkon, South Africa (C. E. & Asst. Mgr., O. F. S. Branch, The Roberts Constr. Co. Ltd., Johannesburg)
GREHAN, BERNARD A., New Orleans, La. (Vice-Pres., B. M. Dornblatt & Associates, Inc.)
GREEN, EDWARD A., Milwaukee, Wis. (Pres., E. A. Green, Inc.)
GURAYMAN, HILMI, Ankara, Turkey (Controlling Engr., Packing Plt., Constr., Selanik)
HALL, VICTOR E., Syracuse, N. Y. (Cons. & Design Engr.)
HARRISON, SIDNEY J., Dunedin, New Zealand (Mech. & Struct. Engr., Mason & Wales)
HAVELKA, KAROL, Tolsteno, Czechoslovakia (Prof., Slovaque Technical High School for Concrete)
HAYBROOK, STEPHEN H., Potsdam, N. Y. (Concrete & Soils Engr., Niagara Mohawk Power Corp.)
HILL, RALPH O., Salt Lake City, Utah (Distr. Mgr., Pittsburgh Testing Lab.)
HOUSER, R. F., Nazareth, Pa. (Chf. Chem., Penn-Dixie Cement Corp.)
IRVIN, LESLIE A., Los Angeles, Calif. (Engrg. Mgr., The Cunneen Co.)
JACOBSMEYER, STANLEY W., Riverside, Calif. (Sales Mgr., Service Rock Co.)
JENNY, DANIEL P., Chicago, Ill. (Struct. Engr., PCA)
JONAH, MAXWELL V., West Newton, Mass. (Stud., Northwestern Univ., U. S. Corps. of Engrs., ROTC Instr.)
JONES, WILSON B., Oceanside, Calif. (Supv. Engr., U. S. Navy, Pub. Works Dept., Camp Pendleton)
KAHN, ASHER D., Washington, D. C. (Sales Supv., Lab. Testing, Wolfkill Vault Service, Hagerstown, Md.)
KARIN, A., Chittagong, East Pakistan (Asst. Engr., Diesel Power Station)
KLEEMANN, ALBERT W., Beirut, Lebanon (Gen. Foreman Constr., Eastern Bechtel Corp.)
KNOP, CARL O., Omaha, Neb. (Struct. Engr., U. S. Army, Corps. of Engrs.)
KONSKI, JAMES L., Syracuse, N. Y. (Proj. Engr. & Gen. Mgr., Erdman & Hosley)
LANGFORD, J. A., Kindersley, Sask., Canada (Design & Supv. all work connected with Schools, W. Central Zone Chairman Board)
LEWIS, HARRY E., Chicago, Ill. (Gen. Mgr., Insulation Div., M. H. Detrick Co.)
LOSEY, HOWARD, JR., Miami, Fla. (Concrete Technician, Maule Industries, Inc.)
LOUMOS, WILLIAM A., Short Hills, N. J. (Supv. Engr., The Austin Co.)
MACHADO, CARLOS, Caracas, Venezuela (Gen. Mgr., Constructora Tierra C. A.)
MAGHOO, JOSE C., Agana, Guam (Res. Engr., Koster & Wythe)
MATZ, PETER H., Littleton, N. H. (Shift Supv., Ebasco Services, Inc.)
MCADAMS, A. C., Fort Worth, Texas (Owner, A. C. McAdams)
MINSKER, JOHN H., Buffalo, N. Y. (Salesman, Bethlehem Steel Co.)
MORENO, JOSE HELI, Maracaibo, Venezuela (Cons. Constr. Engr., Univ. of Zulia, Engrg. Faculty)
MURPHY, DEVEREUX H., Belleville, Ill. (County Supt. of Highways, St. Clair County)
MYLCHREEST, G. D., Hartford, Conn. (Arch. Engr., Mylchreest & Reynolds)
NAITO, TACHU, Tokyo, Japan (Prof., Waseda Univ.)
NELSON, RICHARD H., Santa Ana, Calif. (Sales Engr., Garlinghouse Bros.)
NORTH, LOUIS A., Woodbury, N. J. (Struct. Designer, Earl P. Allabach Assocs., Philadelphia)
ONDERDONK, A. B., Glastonbury, Conn. (Cons. Struct. Engr.)
PARK, K. D., Cambridge, Mass. (Grad. Stud. C. E., MIT)
PARNELL, WILLIAM B., Houston, Texas (Assoc. Prof. of C. E., Univ. of Houston)
PENDREY, L. A., Nampa, Idaho (Mgr., Idaho Concrete Pipe Co.)
PERRONE, ALFRED JOHN, New York, N. Y. (Assoc. Engr., Severud-Elstad-Krueger)
POLATTY, JAMES M., Jackson, Miss. (Chf. Concrete Branch, Corps. of Engrs., Waterways Exper. Sta.)

Continued on p. 25

PROTECT YOUR STRUCTURES AGAINST SHOCK

These three cases vividly show how rail steel reinforcing bars withstand the great forces of blast and earthquake

To topple this coal bunker in Hamilton, Ontario, dynamite was placed in two corner columns and detonated. The photograph shows how the rail steel reinforcing bars nearest the point of explosion appeared after the collapse of the bin. Not a single rail steel bar was broken. (Lateral displacement of the heavy vertical column bars was as great as 18 inches.)

After the Tehachapi earthquake, which caused great damage in Los Angeles, a critical examination was made of the Union Hardware and Metal Company's building. Even though the shock was so severe it shook many articles from their storage bins, not a single crack could be found in this rail steel reinforced concrete building.

When it became necessary to demolish the rail steel reinforced Fourth Street bridge in Williamsport, Pennsylvania, engineers resorted to dynamite. The photo shows how the bars were bent under the force of the explosion, yet not a single one was broken. (What appear as broken bars were actually anchorage bars in the adjacent pier; their ends square cut with shear marks.)

Now available for showings: 16 mm, color movie, "Rail Steel in the World of Today". Write RAIL STEEL BAR ASS'N., 38 So. Dearborn Street, Chicago 3, Illinois.

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BIBLIOGRAPHY ON PRESTRESSED CONCRETE

This 86-page book lists 2000 American and foreign literature references on the subject of prestressed concrete, published 1896 through 1953. A separate section lists some 60 United States, British, German, and French patents. The 8½ x 11-in. format is also punched for easy filing in three-ring binders.

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RAVARD, JORGE ALFONZO, Caracas, Venezuela
RIGO, MIHALY B., Caracas, Venezuela (Drafting & Insp., Cementos Coro)
RODAS, LUIS, Cali, Colombia (Hydraulic & Concrete Structures)
SAMI, SABRI, Cairo, Egypt (Struct. Engr., Egyptian Gov't.)
SANTAELLA, CARLOS MUNOZ, Santurce, P. R. (C. E.)
SCHWEITZER, HARALD, Barcelona, Venezuela (Struct. & C. E., Mene Grande Oil Co.)
SCURICH, CHARLES G., San Francisco, Calif. (Pres. & Gen. Mgr., Steelform Contr. Co.)
SIBLEY, JOHN VICTOR, Ottawa, Canada (Supt. Engr., Pre-Compressed Concrete Engrg. Co.)
SMILG, BENJAMIN, Dayton, Ohio (Mgr., American Ready-Mixed Corp.)
SMITH, WILL C., Chicago, Ill. (Est. & Contact Man, Crane Constr. Co.)
STILLEY, SYDNEY H., Jacksonville, Fla. (Cons. Engr.)
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TRIEF, VICTOR, Brussels, Belgium (Chambre Syndicale des Agglomeres de Ciment)
TROKAN, JOZEF, Tolsteho, Czechoslavkia (Solovauq Technical High School)
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WHITNEY, PAUL H., Chicago, Ill. (Prepare marketing of a light cellular concrete product)
WISDA, JAMES W., JR., Los Angeles, Calif. (Cons. C. E.)
WOOLLATT, SAMUEL TREVOR, Natal, South Africa (Mun. Engr., Design & Constr. of Roads, Borough of Estcourt)
YATES, JASON C., Easton, Pa. (Matls. Engr., Alpha Portland Cement Co.)
YEE, ALFRED A., Honolulu, Hawaii (Cons. Struct. Engr.)
ZELKO, JOSEPH L., Arlington, Texas (Design Engr., Convair Div. of General Dynamics Corp., Fort Worth)

Junior

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DAVIS, CHARLES WILLIAM, Whitesboro, N. Y. (Struct. Designer & Draftsman, Rome Iron Mills, Rome, N. Y.)
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DOYLE, MILTON R., Albuquerque, N. M. (Draftsman, Ferguson, Stevens & Assocs.)
EBSARY, ROBERT BRUCE, Hialeah, Fla. (Draftsman, Oholer & Clarke)
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HOWARD, ROBERT JOSEPH, Hardinsburg, Ky. (Designing & Stress Analysis, McDonnell Aircraft Corp., St. Louis, Mo.)
JENNINGS, VICTOR EDWARD, Melbourne, Australia (Constr. Supt., A. V. Jennings Construction Co. Pty., Ltd.)
KAZMIRCI, MERIH, Bridgeport, Wash. (Designer, Draftsman, Morrison-Knudsen Co., Inc.)
KRYGIER, EDUARDO, Havana, Cuba (C. E., Insp., Arroyo y Menendez)
LINGER, JAMES R., Seattle, Wash. (2nd Lt., U. S. A. F., Proj. Off., Air Installations)

Continued on p. 28

Honor Roll

February 1—August 31, 1954

There are no changes in the top place "member-getters" this month. Raymond E. Davis leads again with 21 credits. President C. H. Scholer and Lewis H. Tuthill still share second place with 8 credits each. F. N. Menefee holds third position but with an increase to 7 credits.

REMEMBER! By expanding ACI, many more opportunities are presented to increase your own knowledge.

Raymond E. Davis	21
C. H. Scholer	8
Lewis H. Tuthill	8
F. N. Menefee	7
Samuel Hobbs	6
James A. McCarthy	6
Earl I. Brown	5
Joseph G. Perri	5
Grant Bloodgood	4
Ted Dahlstrom	4
Henry L. Kennedy	4
J. Luis Montiel G.	4
Adrian Pauw	4
Howard Simpson	4
Robert F. Adams	3
V. J. Cespedes	3
Herbert K. Cook	3
Elmo C. Higginson	3
John J. Hogan	3
J. W. Kelly	3
Hendrik Lauga	3
I. E. Morris	3
Constantin Polidoroff	3
Robert J. Wening	3
Edwin C. Anderson	2
J. H. Appleton	2
Irving S. Backler	2
George F. Bishop, Jr.	2
Carlos D. Bullock	2
R. A. Burmeister	2
Celso A. Carbonell	2
Thomas Cholnoky	2
Miles N. Clair	2
F. Thomas Collins	2
Clayton M. Crosier	2
J. J. Fox	2
J. Fruchtbaum	2
G. M. K. Hagen	2
Robert S. Harris	2
Raja Iliya	2
J. E. Jellick	2
E. A. Johns	2
Clyde E. Kesler	2
R. G. King	2
Warren C. Leinbach	2
L. D. Long	2
H. J. McCrodden	2
William McGuire	2
Ramon Matheus C.	2
W. H. Muirhead	2
William T. Neelands	2
Charles Peterson	2
Balbino Isagani Ponce	2
C. J. Posey	2
Hugo Quillian	2
Jack E. Rosenlund	2
Herbert A. Sawyer, Jr.	2
Leo W. Schmidt	2
Mete Sozen	2
Taylor E. Strubinger	2
J. W. Tinkler	2
David Tom	2
Frank E. Watson	2
Arthur G. Wood	2
Charles C. Zollman	2

Arthur Ruettgers

Arthur Ruettgers, former head of the Bureau of Reclamation's Denver, Colo., laboratories and known for his pioneering work in concrete control techniques, died recently. He directed the Denver laboratories through the period of study for such famous structures as Hoover and Grand Coulee dams.

Mr. Ruettgers was born in Newark, N. J., on Apr. 22, 1889. He received his BS in civil engineering from Allegheny College in 1912, and his masters degree in civil engineering from the University of Michigan in 1915. His first professional employment was as an engineer for the Baltimore and Ohio Railroad in 1912, and for a time he was an instructor at Allegheny College. His Bureau employment began in 1915 on the Sun River project in Montana, and included work on the Riverton project in Wyoming, the Yakima project in Washington, and 25 years in the Denver office of the Bureau.

His enthusiastic interest in concrete technology first bore fruit in 1927 when on the Yakima project, he inaugurated the Bureau's use of modern concrete control techniques. He was appointed first head of the Denver laboratories in 1929. During this period he directed preparation of the first three editions of the Bureau's *Concrete Manual*, an authoritive handbook of information and instruction on concrete control and construction technique. From 1942 until his retirement he directed preparation of the Bureau's *Treatise on Dams* and *Boulder Canyon Project Final Reports*.

He was a member of the American Concrete Institute and the American Society of Civil

Robert Smalls High School, Beaufort, S. C.
Young Lumber Co., General Contractor
Heyward Singley, Architect

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Engineers and contributed a number of scientific papers dealing with concrete research and control.

Glenn R. Dumond

Glenn R. Dumond, superintendent of the Standard Portland Cement Division of Diamond Alkali Co., Painesville, Ohio, died recently. He had been associated with the company for 40 years and had been an ACI member since 1930.

Errata

The following correction should be made in "Fifty Years in the Technical Development of Concrete Pipe," ACI JOURNAL, Feb. 1954, *Proc.* V. 50.

p. 518—The first and second sentences under the heading "Prestressed concrete pipe" should read as follows:

"In 1939 J. E. Miller and Lewiston Pipe Co. (now a part of Price Brothers Co.), Hillside, Ill., constructed several prestressed concrete pipe lines for the city of Hammond, Ind., to operate under a pressure of 40 psi. In 1941 this same company constructed a water line for the village of Melrose Park, Ill., and in 1943 constructed a prestressed concrete pipe line for the city of Chicago to withstand 100 psi. These pipe were made centrifugally by a process somewhat similar to Hume's and then wrapped with high tensile steel wire, which in turn was protected by a vibro-cast coating of cement-sand mortar 1 in. thick. The pipe for the city of Chicago were given a yard test of 200 psi in addition to a line test of 115 psi."

Errata

The following corrections should be made in "Cellular Concretes," ACI JOURNAL, May and June 1954, *Proc.* V. 50.

p. 775 (May JOURNAL)—The second line under the heading "Commercial production and applications" should read as follows: ". . . where virtually all lightweight concrete masonry. . . "

p. 787 (May JOURNAL)—The section heading "Mixing of cellular concrete using the excess water method," now italicized, should be in boldface type, because it is not, strictly speaking, a type of "foamed" cellular concrete, but is a type itself, fitting neither the gas nor the foam designations.

p. 831, Table 7 (June JOURNAL)—A shrinkage value (column 9) is given as "1.14" in the bottom line of the fourth group of data in the table. The correct value is "0.14" percent.

New Members

Continued from p. 25

LINDQUIST, PHILIP RAYMOND, Brockton, Mass.
MAYES, ARTHUR M., Gary, Ind. (Soils Engr., Asst. Res. Engr., Moran-Proctor-Mueser & Rutledge, New York, N. Y.)
MELHEM, MELHEM G., Beirut, Lebanon (C. E., Trans-Arabian Pipeline Co.)
ROJAS, LUIS EDUARDO, Bogota, Colombia (C. E., Soinco Ltd.)
SUMIDA, HENRY MIKIO, San Francisco, Calif. (Jr. C. E., DPW Highways, Calif.)
TEAGUE, GEORGE W., Wright-Patterson AFB, Ohio (2nd Lt., U. S. A. F.)
VELEZ C., GABRIEL, Bogoto, Colombia (C. E., Arco Soinco & Velez Ltd.)
VOUSTAD, RENE C. CABASSA, Mayaquez, P. R. (Struct. & Hydraulic Design, Puerto Rico Water Resources Authority)

Student

BIGELOW, CHARLES D., El Paso, Texas (Univ. of Texas)
CALABRESE, FRANK A., Philadelphia, Pa. (Drexel Inst. of Tech.)
CAUDRA, JOSE S., Managua, Nicaragua (National Univ. of Nicaragua)
DAVIDGE, GEORGE ALFRED, Albany, Calif. (Univ. of Calif.)
GOUVIS, NICHOLAS A., Urbana, Ill. (Univ. of Ill.)
LACY, JOHN E., Austin, Texas (Univ. of Texas)
MOYA, EDWIN S., San Jose, Costa Rica (Univ. de Costa Rica)
OREK, DUNDAR SAIM, Austin, Texas (Univ. of Texas)
RODRIQUEZ, JOSE ANGEL, Managua, Nicaragua (National Univ. of Nicaragua)

General American Transportation acquires Fuller Co.

General American Transportation Corp. has announced acquisition of Fuller Co., Catasauqua, Pa. Fuller Co. is an engineering and manufacturing organization founded in 1926 to develop and market the Fuller-Kinyon system for conveying pulverized material. Other classes of pneumatic conveyors were added later. Its other products used in the cement industry include air-quenching clinker coolers, suspension preheaters, and other equipment.

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Problems and Practices

Continued from p. 21

usual cement and sand grout consists of one part cement, one part concrete sand, and 4½ gal. of water per bag of cement. The sand should be well washed and preferably passing a No. 16 screen. The mortar should have a medium consistency and should not exceed 1/16 in. in average thickness. Such mortar is more satisfactory than neat cement grout as its properties more closely conform with those of the base and topping courses.

The concrete finish is applied immediately after the grout wash and before it has set; laying topping on a dried slurry gives poor adhesion. The topping should, of course, have no slump and contain just enough moisture so that it can be packed into a ball in the hands. Such a topping requires finishing by power float, but this dry mix contains an absolute minimum of water which results in low drying shrinkage and better bond. Also, a bonded surface is likely to fail if the temperature differential between the base slab and the topping mixtures exceeds 5 F.

As in all concrete work, curing is important. Moist curing, use of wet nonstaining sand or sawdust, or waterproof curing paper are good provided strict supervision is given to insure that the curing is carried out thoroughly during the required period. Moist curing should start as soon as water can be applied to the surface without marring the surface and should continue for at least seven days. Where high early strength cement is used the curing period may be reduced to one or two days.

The topping may be cured also by spraying on an approved curing compound, applied according to manufacturer's recommendations, as soon as the surface is dry enough to take it. Many projects have used clear sealing compounds successfully.

The bond of concrete to concrete in floor patching and other repairs will be covered in next month's JOURNAL.

Selected references

1. ACI Committee 802, "Good Practice in Concrete Floor Finish," ACI JOURNAL, Mar. 1930, *Proc.* V. 26, pp. 520-532.

2. ACI Committee 804, "Concrete Wearing Surfaces for Floors," ACI JOURNAL, Sept. 1938, *Proc.* V. 35, pp. 21-30.

3. "Bonding Concrete or Plaster to Concrete," *Publication* ST-11, Portland Cement Assn., Chicago, Ill.

4. *Concrete Manual*, 5th Edition, 1949, U. S. Bureau of Reclamation, pp. 358-367.

5. Eckert, E. E., "Heavy Duty Concrete Floors," ACI JOURNAL, Oct. 1952, *Proc.* V. 49, pp. 109-116.

6. "Granolithic Concrete Floors," *Building Research Station Digest* (England), No. 24, Nov. 1950.

7. Gruenwald, Ernst, "Suggestions on Concrete Floor Construction," ACI JOURNAL, Sept. 1949, *Proc.* V. 46, pp. 49-54.

8. Hornibrook, F. B., and Green, Nathan, "Bonding New Topping to Old Concrete Surfaces (JPP 41-166)," ACI JOURNAL, Apr. 1945, *Proc.*, V. 41, pp. 516-518.

9. Joint Committee, "Recommended Practice and Standard Specifications for Concrete and Reinforced Concrete," American Concrete Institute, 1940, pp. 43-44.

10. Klock, Morgan B., "Monolithic and Bonded Floor Finishes," ACI JOURNAL, June 1949, *Proc.* V. 45, pp. 725-730.

11. Milsom, Gerald, "Concrete Floor Finishing," ACI JOURNAL, Feb. 1949, *Proc.* V. 45, pp. 489-492.

Stone & Webster names Cutler chief structural engineer

Myrton H. Cutler has been appointed chief structural engineer and will become responsible for the administration of the work of the structural division of Stone & Webster Engineering Corp., Boston, Mass. He succeeds Ernest A. Dockstader, who has been named consulting engineer.

Mr. Cutler has been assistant chief structural engineer since January, 1945. He has been active in the design and construction of public utility power stations, industrial power and boiler plants, office buildings, manufacturing plants, and other projects of the Stone & Webster company throughout the United States and Canada. He joined the company in 1923 and has been with it continuously since that time.

Mr. Dockstader, chairman of ACI Committee 505, Design and Construction of Reinforced Concrete Chimneys, headed the structural division since January, 1938. He joined Stone & Webster in September, 1917, as a structural designer. In 1919, he was

made a structural engineer. He became assistant to the chief structural engineer in 1929 and in April, 1930, he was appointed a senior structural engineer.

Tools, Materials, Services

Under this heading note will be made from time to time of producer literature of presumed technical interest (and available from its source for the asking) to ACI users of tools, equipment, materials, accessories, and special services.

Concrete vibrator

An electrically powered concrete vibrator developed by Roeth Vibrator, Inc., is said to be light in weight and easily portable. The unit develops up to 8000 vibrations per min. The motor weighs 32 lb and develops 2 hp under full load.—Roeth Vibrator, Inc., 9229 Chestnut St., Franklin Park, Ill.

Dispersing agent

Commercial application experience and potential uses of two industrial chemicals are outlined in Bulletin No. C-41-1 of The Pacific Lumber Co. Known as Palcotan and Palconate, the products are described as reactive chemicals derived from redwood bark. Applications noted include dispersing cement and cement raw materials, grinding aid in wet and dry milling processes, cement retarder, ore flotation, and others. General properties of the chemicals are given; graphs illustrate behavior under various conditions.—The Pacific Lumber Co., 100 Bush St., San Francisco, Calif.

Power trowel

The new Muller power trowel for finishing concrete surfaces is made in two sizes—29- and 34-in. diameters. A V-belt clutch prevents the blades from going into action before the engine is adjusted to desired speed. Engine speed is regulated by a governor control on the handle. Each trowel has interchangeable float and finishing blades with adjustable pitch. The 29-in. model is powered with a Briggs & Stratton 1¾-hp engine, the 34-in. model with a 2¼-hp B & S engine.—Muller Machinery Co., Inc., Metuchen, N. J.

Coated form ties

Symons Clamp and Manufacturing Co. has announced the addition of a breakback coating to its panel ties and washer ties. The coating reduces the bond between concrete and steel, making it easier to break the tie back an inch inside the wall.—Symons Clamp and Manufacturing Co., 4249 Diversey Ave., Chicago 39, Ill.

Jaw crushers

A 48-page booklet, No. 649, on jaw crushers and stationary primary plants for aggregate processing has been published by Pioneer Engineering Works, Inc. The booklet lists the advantages of overhead eccentric jaw crushers; describes the principle and design, construction features and parts, operation and application; and tells how to select the proper size crusher. Dimension and footing drawings, tables on capacity, toggle, and jaw plate selection, and specifications are given on the 12 sizes of jaw crushers. The 170 series of five stationary primary plants (skid-mounted feeder and jaw crusher installation) is covered also.—Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.

Concrete form liner

"Masonite Concrete Form Preswood," an eight-page use and specification booklet, has been released by Masonite Corp. Material covered includes usage, specifications, and physical characteristics of the wood panel material. Advantages claimed for the product, which can be used as a form liner or structural form board, are resulting smooth exterior concrete surfaces, and ideal hydration of concrete since little water is lost or absorbed.—Home Service Bureau, Masonite Corp., 111 W. Washington St., Chicago 2, Ill.

Truck mixer

Blaw-Knox Co. has developed a new truck mixer that is available in 5½- and 6½-cu yd sizes. By designing the units with the mixer engine at the rear and mounting the mixer transmission on the side of the combination flush water tank and front pedestal, the distance from the front of the mixer to the center of gravity has been reduced 20 in. This permits a better distribution of weight on the truck chassis and still allows use of a short wheel base truck. Bulletin No. 2455 describes the mixers.—Construction Dept., Blaw-Knox Equipment Division, Blaw-Knox Co., Pittsburgh, Pa.

Vermiculite

Two new publications have been issued by Vermiculite Institute. "Versatile Vermiculite in Modern Industry" contains fundamental information on four sizes of vermiculite and lists a number of current uses in each category. "Vermiculite Loose-Fill Building Insulation" describes properties of the material and how it is installed.—Vermiculite Institute, 208 South La-Salle St., Chicago 4, Ill.

Membership in the American Concrete Institute

To facilitate prospective members in joining the Institute, membership application forms are provided. Present Members may aid by bringing these forms to the attention of those who may profit from membership advantages. The grades of membership are described overleaf.

All who have an interest in concrete and a desire to improve it through a nonprofit educational service in gathering, correlating, and disseminating information on design, construction, manufacture, use, and maintenance of concrete structures and products are eligible for Institute membership.

There are many opportunities in the Institute for technical committee activity, contributions from your experience in technical papers and the briefer "Letters from Readers" section, and in reviewing technical literature. Thus you can help further ACI's aim "to provide a comradeship in finding the best ways to do concrete work of all kinds and in spreading that knowledge," and at the same time benefit from the experiences of other Members.

(cut here)

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Date_____

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_____ _____
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Signature_____

For our records, please complete both sides of application.

EXCERPTS FROM BYLAWS: ARTICLE I—MEMBERS

Section 1. This Institute shall consist of Members, Corporation Members, Contributing Members, Junior Members, Student Members and Honorary Members interested in furthering the Institute's objects as set forth in its Charter.

Sec. 2. A Member shall be an individual.

A Corporation Member shall be a firm, corporation, society, agency of government or other organization. A Corporation Member shall name one individual as its representative who will enjoy all membership rights and privileges.

A Contributing Member shall be an individual, firm, corporation, society, agency of government or other organization wishing to give larger support to Institute activities through the payment of larger dues. Contributing Members, other than individuals, shall name representatives as do Corporation Members.

A Junior Member shall be a person less than 28 years old.

A Student Member shall be less than 28 years old and a student in residence at a recognized technical or engineering school.

An Honorary Member shall be a person of eminence in the field of the Institute's interest, or one who has performed extraordinarily meritorious service to the Institute.

Sec. 3. All classes of Members except Honorary Members and Student Members, shall be proposed by at least one Member of the Institute and elected by a two-thirds vote of the Board of Direction. An Honorary Member shall be elected by unanimous vote of the Board of Direction. A Student Member shall be proposed by a member of his school's faculty, who need not be a Member of the Institute, and elected by a two-thirds vote of the Board of Direction.

Sec. 4. All Members shall have all rights and privileges of membership as determined by the Board of Direction except that a Junior or Student Member shall not vote nor hold office. The status of a Student Member shall change automatically to that of Junior Member on the first anniversay of his membership succeeding the date on which he ceases to be a student in residence. The status of a Junior Member shall be changed to that of Member on the first anniversary of his membership after he becomes 28 years of age.

Sec. 5. Applications for and resignations from Membership and requests for change of representatives of Corporation or Contributing Memberships shall be presented in writing to the Secretary-Treasurer. Resignations may be accepted only from Members whose dues are not more than 60 days in arrears, except by special action of the Board of Direction.

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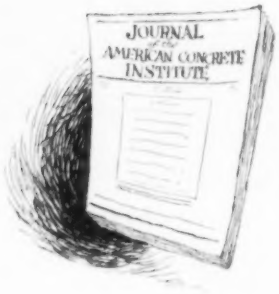

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Interior wall construction in basements

Holes in ties protruding from interior concrete walls and left in place after the form has been stripped make it easy to attach furring strips or 2 x 4's for finishing off basement interiors. With the special ties developed by Irvington Form & Tank Corp., the furring or studs go right up against the wall. Usual procedure in monolithic concrete basement walls is to break off the ties after the concrete has hardened.—Irvington Form & Tank Corp., 20 Vesey St., New York, N. Y.

Bonding cement

The Ceilcote Co. has issued a 4-page leaflet entitled "Corobond—An Improved Bonding Cement for Brick and Tile." The resin cement is said to withstand acids, alkalies, solvents, hot water, and live steam. The leaflet contains a chemical resistance chart and directions for use. In addition to proportions, curing time, storage and cleaning of equipment, and working time at various temperatures is covered.—The Ceilcote Co., 4894 Ridge Road, Cleveland, Ohio

External vibration in pipe manufacture

A 10-page booklet giving facts and figures on the application of external vibration in the manufacture of cast concrete pipe has been issued by Viber Co.—Viber Co., 726 South Flower St., Burbank, Calif.

Vermiculite spandrel wall withstands 5¾-hr fire test

A fire endurance period of 5 hr 45 min has been reported for a 4-in. vermiculite concrete spandrel wall tested by Underwriters Laboratories. The wall was subjected to furnace temperatures ranging from 1700 F the first hour to 2200 F in the fifth. The test wall also withstood a hose stream pressure of 45 lb for 5 min on its fire-exposed side in the fire hose stream test.

The 10 x 10-ft test panel was framed by 2 x 2 x ⅜-in. angle irons on top and bottom connected by 1½ x 1½ x ⅜-in. channels bolted 2 ft on center. Metal clips furred out paper-backed wire lath 1½ in. from the channel face. A 1:4 mix of vermiculite concrete was then machine applied to a 4-in. thickness. The wall was designed for 30 lb per sq ft wind loading.—Vermiculite Institute, 208 South LaSalle St., Chicago 4, Ill.

Joint sealing

Use of neoprene putty to seal construction joints in the buoyant concrete foundations of New York State Thruway's Tappan Zee Bridge is described in *Neoprene Notebook*, No. 58, Mar. 1954, published by E. I. du Pont de Nemours & Co. The neoprene was plasticized with a small amount of solvent. Vulcanization accelerator, mixed in just before the putty was applied, caused the neoprene to cure in place at atmospheric temperatures.—Rubber Chemicals Division, E. I. du Pont de Nemours and Co., Inc., Wilmington, Del.

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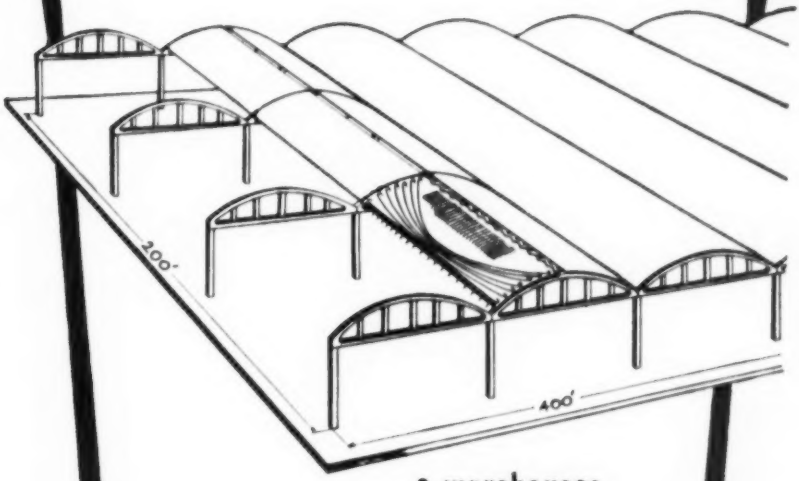

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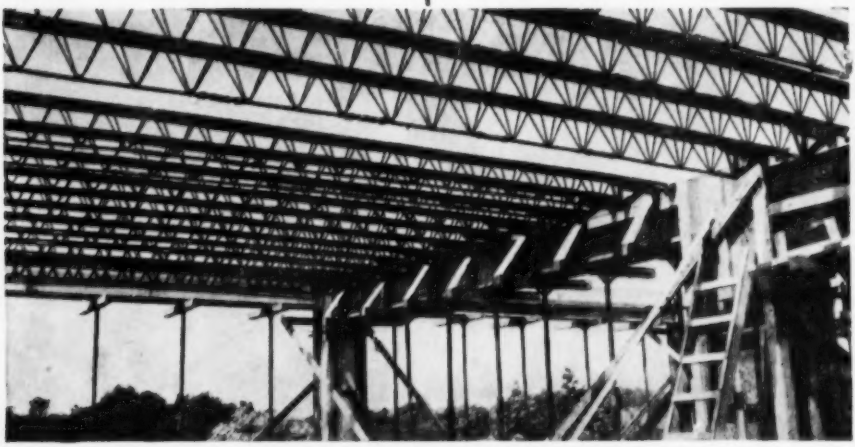

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